

IN THE SPECIFICATION:

Page 1, before line 1, please insert the paragraph:

a 1 -- This application is a continuation of U.S. Serial No. 09/334,125, filed June 15, 1999,  
which is a continuation of U.S. Serial No. 08/370,571, filed January 18, 1995, which is a  
continuation-in-part of U.S. Serial No. 08/184,377, filed January 21, 1994. --.

Page 14, line 19, after "action" please insert --, hereinafter sometimes referred to as "dry shredding",--.

IN THE CLAIMS:

Please cancel claims ~~1-43~~.

Please add the following claims:

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a 44. An absorbent article prepared by a process comprising:  
treating a pulp at a temperature of up to about 60°C, in a suspension, with an alkali  
solution of a concentration from about 2% to about 25% by weight, for a treatment time  
sufficient to obtain an alkali treated pulp of improvement absorbency characteristics containing  
pulp fibers, and  
recovering and drying said treated pulp from said suspension;  
providing at least one fluid permeable topsheet;  
fluffing the dried pulp to form a fluffed pulp; and  
forming an absorbent article having said fluffed pulp therein and applying said fluid  
permeable topsheet thereto.

45. An absorbent article made by a method comprising:  
subjecting a pulp fiber suspension at a temperature of less than about 45°C, in a fiber  
suspension from about 2% up to about 25% consistency, to a caustic solution of a concentration

of about 5% to 25% by weight for a time sufficient to improve the absorbency characteristics of a pulp material resulting from such treatment, said pulp material containing pulp fibers;

recovering said pulp material from the suspension;

drying said pulp material;

fluffing the dried material; and

incorporating the pulp material in an absorbent inner structure of an absorbent article, said article having a fluid permeable cover sheet over said absorbent inner structure.

46. An absorbent article prepared by a process comprising:

subjecting a pulp fiber suspension at a temperature of less than 45°C, in a fiber suspension from about 2% up to about 25% consistency, to a caustic solution of a concentration of about 5% to 25% by weight for a time sufficient to improve the absorbency characteristics of a pulp material resulting from such treatment, said pulp material containing pulp fibers;

recovering and drying said pulp fibers from said suspension;

fluffing said dried pulp fibers; and

forming an absorbent article comprising an absorbent interior and a fluid permeable exterior comprising a fluid permeable coversheet, said fluffed pulp fibers being incorporated in said absorbent interior.

47. The article of Claim 46, wherein the temperature of said pulp fiber suspension is less than about 40°C, the fiber suspension is from about 2% to 10% consistency, and the caustic solution is at a concentration from about 5% to about 18% by weight.

48. The article of Claim 46, wherein the concentration of said caustic solution is between 13% and 15% by weight.

49. The article of Claim 46 wherein the concentration of said caustic solution is between 5% and 10% by weight.

50. The article of Claim 46, wherein said pulp is from a pulp source starting material of Southern pine, White pine, Western hemlock, a Sitka spruce, Caribbean pine, Douglas fir or mixtures of same.

51. The article of Claim 46, wherein said pulp is from a pulp source starting material of eucalyptus, poplar, beech, aspen or bagasse.

52. The article of Claim 46, wherein the temperature of said caustic treatment is about 30°C and a time of treatment is from about 5 minutes to about one hour.

53. An absorbent article, prepared by a process comprising:  
treating a pulp at a temperature of less than about 40°C in a suspension with a caustic solution of a concentration from about 13% to about 18% by weight, for a treatment of time sufficient to obtain a caustic treated pulp of improved absorbency, said treated pulp containing pulp fibers, and

recovering the caustic treated pulp from said suspension;  
drying the recovered pulp;  
fluffing the dried pulp; and  
forming an absorbent article having an absorbent interior and a fluid permeable coversheet, said fluffed pulp being incorporated in the absorbent interior.

54. The article of Claim 53, wherein said pulp is an unbleached pulp with a K number of 8 or above before the same is treated with caustic solution.

55. The article of Claim 53, wherein said pulp is partially bleached before treatment of same with said caustic solution.

56. The article of Claim 53, wherein the pulp is a chemical-mechanical pulp or organic solvent obtained pulp.

57. The article of Claim 53, wherein a bleached pulp is a kraft process pulp, before said pulp is treated with said cold caustic solution.

58. The article of Claim 53, wherein said absorbent article is a baby diaper having a fluid barrier sheet, the fluid permeable coversheet and the fluid barrier sheet being on opposing sides of the absorbent interior of the absorbent article.

59. The article of Claim 53, wherein a pulp source starting material is a pulp derived from a softwood.

60. The article of Claim 53, wherein said pulp is bleached prior to its treatment with a caustic solution to an ISO brightness percentage of about 25 and higher.

61. The article of Claim 53, wherein said pulp is treated with a caustic solution in a suspension of about 3% by weight (O.D.) pulp at a temperature from about 25°C to about 40°C for a period of time sufficient to improve said absorbency for said pulp.

62. The article of Claim 53, wherein the treated pulp has a K number of at least 12 and the caustic solution has a concentration of about 13% to about 15% by weight.

63. The article of Claim 53, wherein the concentration of said caustic solution is from about 13% to about 15% by weight.

64. The article of Claim 53, wherein said pulp is from a pulp source starting material of Southern pine, White pine, Western hemlock, a Sitka spruce, Caribbean pine, a Douglas fir or mixtures of same.

65. The article of Claim 53, wherein the temperature of said caustic treatment is about 30°C and a time of treatment is from about 5 minutes to about one hour.

66. An absorbent device having an outer acquisition layer and an inner absorbent core element prepared by a process comprising:

pulping a cellulose pulp source starting material to a K number of at least about 8 to obtain a cellulose pulp,

a<sup>2</sup>  
treating said cellulose pulp at a temperature of less than about 45°C in a suspension with a caustic solution of a concentration from about 5% to about 25% by weight, for a treatment time sufficient to obtain a cellulose pulp of improved absorbency containing pulp fibers and suitable for absorbency applications in said absorbent device, and recovering the caustic treated pulp from said suspension;

sheeting and drying the caustic treated pulp into a sheet of a basis weight from 200 to 800 grams per meter squared; and

incorporating said sheet in said absorbent device as a core element of the device or as an outer layer for said absorbent device on at least one surface of a core element of said device.

67. The device of Claim 66, wherein the sheet is incorporated in said core element and the pulp is derived from Southern pine pulp source material.

68. The device of Claim 66, wherein the device is configured for use as a baby diaper.

69. The device of Claim 66, wherein the device is configured for use as a catamenial device.

70. The device of Claim 66, wherein the device is configured for use as an incontinence device.

71. The article of Claim 53, wherein said fluffed pulp comprises our acquisition layer element.

72. An absorbent device comprising cellulosic fibrous material obtained by the process of pulping a cellulosic source material which has K number of at least 12, treating said pulped cellulosic material with a cold caustic solution at a treatment temperature of less than 40°C, in a suspension of about 2% to about 15% consistency, said cold caustic solution being at a

concentration of from about 5% to 25% by weight; recovering said caustic treated cellulosic material; drying said recovered cellulosic material; and fluffing said dried cellulosic material.

73. The absorbent device of Claim 72 wherein said recovered caustic treated cellulose material is mechanically treated.

74. The absorbent device of Claim 72 wherein said recovered caustic treated cellulosic material is beaten.

75. The absorbent device of Claim 72 wherein said cellulosic source material is pulped to a K number of at least about 20.

76. The absorbent device of Claim 72 wherein the device is configured for use as a baby diaper, a catamenial device, or an incontinence device.

77. An absorbent device prepared by a process comprising:  
treating a cellulosic starting material at a temperature of less than about 45°C, in suspension, with a caustic solution of a concentration from about 5% to about 10% by weight, said concentration being dependent on the process employed, cellulose species used and/or on the amount of lignin in said cellulosic starting material, wherein said caustic solution is in contact with said cellulosic starting material for a treatment time sufficient to obtain a caustic treated cellulosic material of improved absorbency values, and containing pulp fibers,

and recovering caustic treated cellulosic material from said suspension;

drying the recovered cellulosic material; fluffing the dried cellulosic material;

and incorporating the fluffed cellulosic material in an absorbent article, said article having an absorbent interior containing the fluffed pulp and a fluid permeable outer sheet over the absorbent interior.

78. The device of Claim 77, wherein said cellulosic starting material is an unbleached pulp with a K number of at least about 8.

79. The device of Claim 77, wherein said cellulosic starting material is a bleached pulp.

80. An absorbent article prepared by a process comprising:

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- (a) creating a suspension of about 2% to about 25% by weight cellulosic pulp in an alkali solution having an alkali concentration from about 5% to about 25% by weight and a temperature of up to about 40°C;
  - (b) maintaining said cellulosic pulp in said suspension for a treatment time between about 2 to about 10 minutes to obtain a cold caustic extracted pulp of improved absorbency characteristics containing pulp fibers; and
  - (c) recovering said cold caustic extracted pulp from said suspension to obtain a high absorbency pulp;
  - (d) drying said high absorbency pulp;
  - (e) fluffing said high absorbency pulp to produce a fluffed pulp ; and
  - (f) incorporating said fluff pulp in an absorbent article, said article having an absorbent interior containing the fluffed pulp and a fluid permeable outer sheet over the absorbent interior.

81. The article of Claim 80, wherein the absorbent article has an impermeable barrier sheet under absorbent interior.

82. The article of Claim 44, wherein a fluid impermeable barrier is provided and applied to said fluff pulp opposite the fluid permeable coversheet.

83. The article of Claim 45, wherein article being formed with a fluid impermeable barrier on a side of the absorbent article opposite the fluid permeable coversheet.

84. The device of Claim 66, and said device having a fluid permeable topsheet adjacent the outer layer of the diaper.

85. The device of Claim 84, and said device having an impermeable barrier sheet adjacent a side of the absorbent core opposite to the topsheet.

86. The device of Claim 72, said device further comprising a fluid impermeable barrier under said material.

87. The device of Claim 77, said absorbent article being formed with a fluid impermeable barrier on a side of the absorbent article opposite the fluid permeable coversheet.

a<sup>2</sup> 88. A personal hygiene article comprising an absorbent composite prepared by a method which comprises:

treating a wood fiber pulp containing wood fibers with a base at a temperature ranging from about 0°C to about 60°C thereby forming a treated wood fiber pulp containing wood fibers;

forming the treated wood fiber pulp into an absorbent sublayer material comprised of the base-treated wood pulp;

providing at least one fluid permeable topsheet layer; and placing the sublayer material below the topsheet layer.

89. The article of Claim 88, said forming step including dry shredding the treated wood fiber pulp so that the absorbent sublayer material formed is comprised of shredded base-treated wood pulp.

90. The article of Claim 89, and said method further comprising providing at least one substantially fluid impermeable backsheet layer below the sublayer material.

91. A personal hygiene article comprising an absorbent composite prepared by a method which comprises:

treating a wood fiber pulp containing wood fibers with a base at a temperature ranging from about 0°C to about 60°C thereby forming a treated wood fiber pulp containing wood fibers;



dry shredding the treated wood fiber pulp to form an absorbent sublayer material comprised of shredded base-treated wood pulp; providing at least one fluid permeable topsheet layer and at least one substantially fluid impermeable backsheet layer, and interposing the sublayer material between the topsheet layer and the backsheet layer.

a<sup>2</sup> 92. The article of Claim 91 wherein the sublayer material contains from about 25 to about 100% by weight of shredded base treated wood pulp and from about 0 to about 75% by weight of unprocessed fibers.

93. The article of Claim 91 wherein the sublayer material is further characterized as having a strike-through acquisition re-wet weight of less than about 40 grams.

94. The article of Claim 91 wherein the sublayer material has a pre-poured saturated drainage (PSD) capacity greater than about 400 mL.

95. The article of Claim 91 wherein said method further comprises connecting at least a portion of the topsheet layer to at least a portion of the backsheet layer so as to define an enclosure containing the sublayer.

96. An absorbent hygiene device comprising:  
porous fluff material;  
wherein said porous fluff material comprises fluffed wood fiber pulp; and  
wherein said fluffed wood fiber pulp has been prepared by a process comprising the steps of:

cold caustic extraction; and

converting dried, sheeted wood pulp to fluff.

97. The device of Claim 96,

wherein said cold caustic extraction step is carried out:

for about 15 minutes;

at a temperature of about 30°C;  
at a pulp consistency of about 3%; and  
at a cold caustic concentration of about 13%.

98. An absorbent hygiene device comprising:

a layer that allows liquid to pass, and wood fiber fluff; and  
wherein said wood fiber fluff has been prepared by a process comprising the step

of:

treating a wood pulp with cold caustic extraction.

99. The absorbent hygiene device of Claim 98,

wherein said cold caustic extraction step is carried out:

for about 15 minutes;

at a temperature of about 30°C;

at a pulp consistency of about 3%; and

at a cold caustic concentration of about 15%.

100. An absorbent hygiene device comprising:

a layer that allows liquid to pass, and

an absorbent core,

wherein said absorbent core comprises wood fiber fluff; and

wherein said wood fiber fluff has been prepared by a process comprising the step

of:

treating a wood pulp with cold caustic extraction.

101. The absorbent hygiene device of Claim 100,

wherein said device is a diaper.

102. The absorbent hygiene device of Claim 100,

wherein said cold caustic extraction step is carried out:

for about 15 minutes;

at a temperature of about 30°C;

at a pulp consistency of about 3%; and

at a cold caustic concentration of about 15%.

103. The absorbent hygiene device of Claim 102,

wherein said device is a diaper.

104. An absorbent personal hygiene device comprising:

a layer that allows liquid to pass,

a water barrier sheet,

an absorbent core interposed between said layer and said sheet,

the absorbent core containing at least about 25% of fluffed wood fiber pulp,

wherein said fluffed wood fiber pulp comprises wood fiber pulp that has been:

cold caustic extracted and fluffed by mechanical action.

105. The device of Claim 104

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

106. The device of Claim 104,

wherein the absorbent core contains between about 25% to about 75% of said fluffed wood fiber pulp and between about 25% to about 75% other pulp.

107. The device of Claim 106,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

108. The device of Claim 104,

wherein the absorbent core contains at least about 25% of said fluffed wood fiber pulp and also comprises a super absorbent polymer.

109. The device of Claim 108,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

110. The device of Claim 104,

wherein said fluffed wood fiber pulp is a mercerized wood pulp.

111. The device of Claim 110,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

112. The device of Claim 104,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

113. The device of Claim 105,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

114. The device of Claim 103,

wherein said fluffed wood fiber pulp is further characterized by having a strike-through acquisition re-wet weight of less than about 40 grams.

115. The device of Claim 114,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

116. The device of Claim 105,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL, and

wherein said fluffed wood fiber pulp is further characterized by having a strike-through acquisition re-wet weight of less than about 40 grams.

117. The device of Claim 104,

wherein said cold caustic extraction step is carried out on a softwood pulp:

for between 10 and 15 minutes;

at a temperature between 15 °C and about 35 °C;

at a pulp consistency between 3% and 8%; and

at a cold caustic concentration between 13% and 18%.

118. The device of Claim 117,

wherein said softwood pulp is prehydrolyzed kraft of a southern pine blend bleached to an ISO brightness of 86.7 %, and

wherein said cold caustic extraction step is carried out :

for 10 minutes;

at a temperature of 25 °C;

at a pulp consistency of 3%, and

at a cold caustic concentration of 15%.

119. A disposable high absorbency diaper comprising:

a layer that allows liquid to pass,

a water barrier sheet,

an absorbent core interposed between said layer and said sheet,

the absorbent core containing at least about 25% of fluffed wood fiber pulp,

wherein said fluffed wood fiber pulp comprises wood fiber pulp that has been:

cold caustic extracted and fluffed by mechanical action.

120. The diaper of Claim 119,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

121. The diaper of Claim 119,

wherein the absorbent core contains between about 25% to about 75% of said fluffed wood fiber pulp and between about 25% to about 75% other pulp.

122. The diaper of Claim 121,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

123. The diaper of Claim 119,

wherein the absorbent core contains at least about 25% of said fluffed wood fiber pulp and also comprises a super absorbent polymer.

124. The diaper of Claim 123,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

125. The diaper of Claim 119,

wherein said fluffed wood fiber pulp is a mercerized wood pulp.

126. The diaper of Claim 125,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

127. The diaper of Claim 119,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

128. The diaper of Claim 120,  
wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD)  
capacity of greater than 400 mL.

129. The diaper of Claim 119,  
wherein said fluffed wood fiber pulp is further characterized by having a strike-  
through acquisition re-wet weight of less than about 40 grams.

130. The diaper of Claim 129,  
wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD)  
capacity of greater than 400 mL.

131. The diaper of Claim 120,  
wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD)  
capacity of greater than 400 mL, and  
wherein said fluffed wood fiber pulp is further characterized by having a strike-  
through acquisition re-wet weight of less than about 40 grams.

132. The diaper of Claim 119,  
wherein said cold caustic extraction step is carried out on a softwood pulp:  
for between 10 and 15 minutes;  
at a temperature between 15 °C and about 35 °C;  
at a pulp consistency between 3% and 8%; and  
at a cold caustic concentration between 13% and 18%.

133. The diaper of Claim 132,  
wherein said softwood pulp is prehydrolyzed kraft of a southern pine blend  
bleached to an ISO brightness of 86.7 %, and  
wherein said cold caustic extraction step is carried out :

for 10 minutes;  
at a temperature of 25 °C;  
at a pulp consistency of 3%, and  
at a cold caustic concentration of 15%.

134. The diaper of Claim 133,  
wherein the fluffed wood fiber pulp is composed of cellulose II fibers.

135. The diaper of Claim 134,  
wherein said layer is substantially coterminous with said sheet.

136. A high absorbency catamenial device comprising:  
a layer that allows liquid to pass,  
a water barrier sheet,  
an absorbent core interposed between said layer and said sheet,  
the absorbent core containing at least about 25% of fluffed wood fiber pulp,  
wherein said fluffed wood fiber pulp comprises wood fiber pulp that has been:  
cold caustic extracted and  
converted from dried, sheeted wood pulp to fluffed fibers by mechanical action.

137. The device of Claim 136,  
wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1  
seconds or less.

138. The device of Claim 136,  
wherein the absorbent core contains between about 25% to about 75% of said  
fluffed wood fiber pulp and between about 25% to about 75% other pulp.

139. The device of Claim 138,



wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

140. The device of Claim 136,

wherein the absorbent core contains at least about 25% of said fluffed wood fiber pulp and also comprises a super absorbent polymer.

141. The device of Claim 140,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

142. The device of Claim 136

wherein said fluffed wood fiber pulp is a mercerized wood pulp.

143. The device of Claim 142,

wherein said fluffed wood fiber pulp has a 3rd insult absorption time of 31.1 seconds or less.

144. The device of Claim 136,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

145. The device of Claim 137,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

146. The device of Claim 136,

wherein said fluffed wood fiber pulp is further characterized by having a strike-through acquisition/re-wet weight of less than about 40 grams.

147. The device of Claim 146,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL.

148. The device of Claim 137,

wherein said fluffed wood fiber pulp has a pre-poured saturated drainage (PSD) capacity of greater than 400 mL, and

2 wherein said fluffed wood fiber pulp is further characterized by having a strike-through acquisition re-wet weight of less than about 40 grams.

149. The device of Claim 136,

wherein said cold caustic extraction step is carried out on a softwood pulp:

for between 10 and 15 minutes;

at a temperature between 15 °C and about 35 °C;

at a pulp consistency between 3% and 8%; and

at a cold caustic concentration between 13% and 18%.

150. The device of Claim 149,

wherein said softwood pulp is prehydrolyzed kraft of a southern pine blend bleached to an ISO brightness of 86.7 %, and

wherein said cold caustic extraction step is carried out :

for 10 minutes;

at a temperature of 25 °C;

at a pulp consistency of 3%, and

at a cold caustic concentration of 15%.